Engineering Manual

Calculation of Simple Case Flange Connection

Revision No:	0	Date:	
Project Name	test		
Customer			
Tendering / OED / PD No.			
Project Comments			
Component			
3D Part or Drawing No.			
Sheet Comments			

Figures/Sketches/Equations

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SULZER

MI-T-526-0000

Nov 05, 2019	Name:		M.Kulkarni
Application Code			
Application Standard			
Pump Designation			
Calc. Version No.			
Date & Name	Jan 16, 2020	kulkmit	

Input Data			
Casing Geometry			
Outer diameter	$D_{case\_o} =$	mm	0.000
Inner diameter	$D_{case\_i} =$	mm	0.000
Case thickness	$T_{case} =$	mm	0.000
Flange Geometry			
		☐ No Countersink	
Outer diameter	$D_{flange\_o} =$	mm	0.000
Inner diameter	$D_{flange\_i} =$	mm	0.000
Raised face diameter	$D_{face} =$	mm	0.000
Raised face height	$h_{face} =$	mm	0.000
Flange height	$T_{flange} =$	mm	0.000
Stud hole diameter	$D_{hole} =$	mm	0.000
Countersink diameter	$D_{counter} =$	mm	0.000
Countersink depth	$L_{counter} =$	mm	0.000
Pressure diameter	$D_{pressure} =$	mm	0.000
Cover thickness	$T_{cover} =$	mm	0.000
Radial gap of shoulder contact	$\mathrm{r} =$	mm	0.000
Mechanical Seal Gland Geometry			
Mechanical seal outer diameter	$D_{mseal} =$	mm	0.000
Bolting Geometry			
		☐ Fully Threaded Stud	
Number of bolts	$N_{bolts} =$		0
Nominal thread size	$D_{thread} =$	mm	0.000
Thread pitch	$P_{thread} =$	mm	0.000
Engaged thread length	$L_{thread} =$	mm	0.000
Waist diameter	$D_{waist} =$	mm	0.000
Bolt head diameter	$D_{head} =$	mm	0.000
Bolt head height	$L_{head} =$	mm	0.000
Pitch circle diameter	$D_{bolts} =$	mm	0.000

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Materials			
Casing elastic modulus	$E_{case} =$	MPa	0.0
Casing Poisson's ratio	$\nu_{case} =$		0.000
Casing secant coefficient of thermal ex	$\alpha_{case} =$	1/°C	0.0000000
Flange elastic modulus	$E_{flange} =$	MPa	0.0
Flange Poisson's ratio	$\nu_{flange} =$		0.000
Flange secant coefficient of thermal ex	$\alpha_{flange} =$	1/°C	0.0000000
Bolt elastic modulus	$E_{bolt} =$	MPa	0.0
Bolt Poisson's ratio	$\nu_{bolt} =$		0.000
Bolt secant coefficient of thermal expa	$\alpha_{bolt} =$	1/°C	0.0000000
Loads			
Bolting pretension	$F_{bolt} =$	N	0.0
Pressure	$P =$	MPa	0.00
Temperature	$T =$	°C	0.0

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Input validation		
Check :	$0 \leq D_{flange\_i} < D_{flange\_o}$	Not OK
Check :	$0 < D_{case\_i} < D_{case\_o}$	Not OK
Check :	$D_{case\_i} \leq D_{pressure} < D_{bolts} - D_{hole}$	Not OK
Check :	$D_{pressure} < D_{face} < D_{flange\_o}$	Not OK
Check :	$D_{bolts} + D_{hole} < D_{flange\_o}$	Not OK
Check :	$D_{thread} < D_{hole} < D_{head}$	Not OK
Check :	$L_{counter} < T_{flange}$	Not OK
Check :	$0 < L_{thread} < T_{case}$	Not OK
Check :	$3 \leq N_{bolts}$	Not OK
Check :	$0.52 \cdot P_{thread} < T_{case} - L_{thread}$	Not OK
Check :	$0 < D_{thread}$	Not OK
Check :	$0 < D_{bolts}$	Not OK
Check :	$0 < L_{head}$	Not OK
Check :	$0 \leq r$	OK
Check :	$0 \leq h_{face}$	OK
Check :	$Arcsin(D_{counter}/D_{bolts}) < 180/N_{bolts}$	Not OK
Check :	$0 \leq D_{mseal} < D_{flange\_i}$	Not OK
Check :	$L_{counter} > 0$	Not OK
Check :	$D_{counter} > D_{head}$	Not OK
Check :	$0 < D_{waist} < D_{hole}$	Not OK
	Run Simulation	Input Validation : Fail

Output		
Pretension load		
Equivalent transverse force	N	0.0
Equivalent Bending moment @ thread	Nm	0.0
Equivalent Bending moment @ head	Nm	0.0
Pressure load		

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	Equivalent transverse force	N	0.0
	Equivalent Bending moment @ thread	Nm	0.0
	Equivalent Bending moment @ head	Nm	0.0
	Embedded quality check		